

REMARKS

Claims 1-7 are pending in the application. Claims 1-7 have been rejected. Claims 1, 6, and 7 have been amended. Claims 1 and 7 are independent claims.

The disclosure is objected to for failing to meet the proper requirement. Specifically, the Office Action alleges that the sentence beginning in page 6, line 20 reads awkwardly. In response, the applicants have amended the specification.

Claim 1-7 stand rejected under 35 U.S.C. §103(a) as allegedly being obvious over Gentzler et al. (U.S. 6,396,344 B1) ("Gentzler") in view of Yoshida et al. (U.S. 6,437,320 B1) ("Yoshida").

Claim 1 recites: An optical power equalizer, comprising:
a wavelength coupler for separating an optical signal traveling upstream from a single optical fiber;
an optical splitter for allowing a part of the upstream optical signal to be transferred to an optical detector for detecting the upstream optical signal's intensity, the optical detector outputting an electrical signal having a signal amplitude proportional to the upstream optical signal's intensity;
an active gain control circuit for controlling a driving current to be provided to an optical amplifier according to the electrical signal; and
a delay element for delaying the upstream optical signal by a time required for the optical detector and the active gain control circuit to perform their operation,
wherein the optical amplifier amplifies the upstream optical signal with an amplification gain according to the driving current from the active gain control circuit.

The present invention includes a wavelength coupler that separates upstream signals; a detector for detecting for detecting the upstream signals, and an active gain control circuit ("AGC") provides a driving current based on the detected upstream signal from the detector. Such configuration enables the claimed equalizer to provide a driving current based on the intensity of the optical signal, without comparing the intensities at input and output stages (See

page 9, line 19 – page 10, line 3). Moreover, such configuration enables the claimed equalizer to harmonize upstream optical signals, such that optical receiver of OLT receiving the harmonized signals can process them with ease (See page 2, line 18-21). As noted in the specification, it is difficult for the optical receiver to process upstream signals with different intensities (See id.).

Gentzler, as read by applicants, discloses a system that minimizes nonlinearities in non-optical signal as the signal is amplified or transmitted (Column 1, line 16-29). Such minimization is necessary because nonlinearities from such amplifier generate byproducts that can decrease the transmission bandwidth. The system minimizes nonlinearities from an amplifier by detecting the signal's intensity at input and output stages and performing linearization if any difference exists based on the comparison result (column 5, line 27-29; see also column 6, line 32-36).

Yoshida, as read by applicants, discloses a device capable of maintaining amplification characteristics of optical signal despite change in ambient temperature. (Column 1, line 11-15) According to Yoshida, nonlinearities increase as ambient temperature of the amplifier changes. Yoshida, similar to Gentzler, maintains the linearity by comparing the intensity of the signal at the input and output stages and performing linearization based on the comparison outcome (Column 4, line 10-12).

Applicants respectfully submits that neither Gentzler nor Yoshida, alone or in combination, renders claim 1 obvious for the following reasons.

Gentzler or Yoshida, alone or in combination, fails to teach the harmonization of optical signal's intensity based solely on intensity signal without the need of comparing both the input and output intensities. More specifically, both references fail to teach or show an AGC that provides a driving current based only on an electrical signal from the detector.

In addition, neither Gentzler nor Yoshida discloses a wavelength coupler within the equalizer that separates an optical signal traveling upstream from a single optical fiber, as cited in claim 1. The Office Action indicates that such coupler is disclosed in Gentzler. However, applicants respectfully submit that the coupler in Gentzler is, in fact, an input port (Figure 3, 4, 6, and 7; column 6, line 32-36). As such, the input port of Gentzler fails to show or teach the function of separating an input optical signal. Further, nowhere in Yoshida teach or show such a coupler.

Accordingly, both Gentzler and Yoshida fail to show or teach a coupler that separates an optical signal traveling upstream from a single optical fiber, as recited in claim 1.

Thus, applicant respectfully submit that there would have been (1) no motivation for one of ordinary skill to combine Gentzler with Yoshida and (2) even if such a combination were possible, it would still not teach all of the limitations of independent claim 1, for example. applicants can find no indication as to how and where the teachings would be combined in the cited art.

Furthermore, applicants respectfully submit that the Office Action is improperly equating two different inventions. The Court of Appeals for the Federal Circuit has stated that:

The examiner must show reasons that the skilled artisan, **confronted with the same problems** as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for combination in the manner claimed..

In Re Denis Rouffet, 47 USPQ.2d 1453, 1457-58 (Fed. Cir. 1998) (emphasis added).

The Office Action fails to meet this requirement. Nothing found in the reference cited in the Office Action addresses the **same problems** of the prior art solved by the present invention as defined in claim 1. The equalizer of claim 1 harmonizes intensities of **different** optical signals so that the optical receiver of OLT can process the signals with ease (See page 2, line 18

– page 3, line 1; see also page 3, line 20-21; see also page 4, line 10). However, Gentzler and Yoshida address minimizing non-linearity of the signal caused by amplifiers, or change in temperature, so that transmission bandwidth will not be narrowed (See Gentzler, column 1, line 16-29; See Yoshida, column 1, line 11-15). Nowhere in the cited references address harmonizing the intensities of **different** optical signals so that the optical receiver of OLT can process upstream signals with ease.

Applicants respectfully submit that such rationale is not present in the teachings of the references and thus the claims would not have been obvious to a person of ordinary skill in the art at the time of invention. Accordingly, applicants respectfully request withdrawal of rejection on claim 1.

With regards to the rejection of Claim 6, a method claim, applicants submit that the claim, as amended, distinguishes it from Gentzler or Yoshida, alone or in combination.

The amended claim 6 recites; A method for optical power equalization for optical signals traveling upstream in a passive optical network, the method comprising the step of:
separating an input optical signal traveling upstream from a single optical fiber;
detecting the input upstream optical signal's intensity;
providing **an indication** of the input upstream optical signal's intensity;
delaying the input upstream optical signal, and
amplifying the input upstream optical signal **in accordance with the indication** to keep the optical intensities of the input upstream signals incoming from a plurality of Optical Network Units uniform.

The argument set forth regarding claim 1 equally applies to claim 6 as claim 6 has amended to reflect similar features. Accordingly, applicants respectfully request withdrawal of the rejection on claim 6.

Other claims in this application are each dependent on the independent claims and are therefore believed patentable for the same reasons. Since each dependent claim is also deemed

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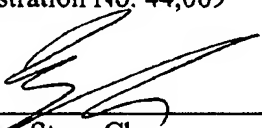
to define an additional aspect of the invention, however, the individual consideration of the patentability of each on its own merits is respectfully requested.

For all of the foregoing reasons, it is respectfully submitted that the present Application is patentable in view of cited reference. A notice to that effect is respectfully solicited. If any issues remain which may be best resolved through a telephone communication, the Examiner is requested to kindly telephone the undersigned telephone number listed below.

Respectfully submitted,

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 7/7/05
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